Canine Bulletin

February 1999

Nebraska Task Force - 1

In Ethylene Glycol Poisoning, Every Second Counts

It is estimated that approximately 10,000 dogs are poisoned by ethylene glycol each year.[1] Experts believe the pleasant taste and wide-spread availability of ethylene glycol result in its ingestion. A very small amount of ethylene glycol is toxic to animals. For an average sized dog (20 lb.), three tablespoons (less than 1/4 cup) may be lethal. If untreated, ethylene glycol poisoning may result in kidney damage and death. Many dogs poisoned by ethylene glycol die before a diagnosis can be made, or too late for treatment to be effective. Rapid diagnosis and treatment are crucial to a successful out-come for a dog that has ingested ethylene glycol.

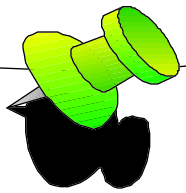
Ethylene glycol (antifreeze) poisoning has the highest fatality rate of all common poisons among animals.

The more prominent clinical signs of ethylene glycol poisoning (drunken stupor) are noted relatively soon after ingestion (with-in 20 minutes to 6 hours). Over the course of hours, the poisoning will progress fairly rapidly through other stages, and the dog may even appear to "get better" by the time it is taken to the veterinarian. Because of the rapid time progression and overlap of stages, ethylene glycol poisoning can be difficult to identify and diagnose if the ingestion was not witnessed.

Continued on page 2

Most of the harmful effects of ethylene glycol poisoning are associated with its toxic metabolites. Once ethylene glycol is ingested, it is absorbed quickly by the stomach, then goes to the liver, where it is converted by several enzymes (most notably alcohol dehydrogenase, ADH) to breakdown products, or metabolites. It is these metabolites that poison the dog's system, especially the kidneys. The liver can process only so must of the ethylene glycol at a time. The goal of treatment with Antizol-Vet™ fomepizole) for injection is to tie-up ADH, and thus prevent or limit the amount of ethylene glycol that is converted to toxic metabolites.

Training Logs Submission Address:
Mail or Drop off Logs to:
Sandy Yost
Lincoln Fire Department
1801 'Q' Street
Lincoln, NE 68508



Submission of Items for the *"Canine Bulletin"*...

Please submit items by mail, fax or e-mail to:

Julie Marget
Lincoln Fire Department
1801 'Q' Street
Lincoln, NE 68508

Fax: 441-7098

E-Mail: jmarget@email.ci.lincoln.ne.us

Address/Phone # Changes Contact:
Julie or Sandy @ LFD Fire Administration
(402) 441-7363

Continued from page 1

Signs of the ethylene glycol (antifreeze) poisoning

It is extremely important for dog owners to be aware of the toxicity of ethylene glycol and to be able to describe the signs they have observed in their dog to their veterinarian.

1. ***Drunken state***
   The dog may appear to be in a stupor. It may stagger, weave, stumble, and fall. In addition, the dog may be uncoordinated, disoriented, and have decreased reflexes

2. ***Listlessness***
   The dog may appear depressed and incoherent.

3. ***Polyuria***
   The diuretic effect of ethylene glycol results in the d urinating frequently.

4. ***Polydipsia***
   The dog will be excessively thirsty.

5. ***Vomiting***
   Ethylene glycol is only mildly irritating to the mucosa. Although it may occur vomiting is not persistent and may not be witnessed.

Dogs may behave differently at the clinic or hospital than at home. They may act more alert once they arrive at the clinic or hospital because it is a new environment, even though they seemed depressed at home. In addition, as dogs pass through the stages of ethylene glycol metabolism, they often appear to recover, but then rapidly deteriorate. Although the dog seems to be getting better around 12 - 18 hours after ingestion, it will actually get worse before it gets better. After an apparent recovery phase, some of the signs similar to those evident soon after the poisoning will return. The dog may be depressed and may vomit again, however, the drunken effect of ethylene glycol will not longer be present.

Continued on page 3

If your dog exhibits any of these signs, or if you suspect it has ingested antifreeze, see your veterinarian immediately.

Canine Bulletin

Published by
Lincoln Fire Department
Administration
1801 'Q' Street
Lincoln, NE 68508

Phone: (402) 441-7363
Fax: (402) 441-7098
E-Mail: fire@ci.lincoln.ne.us
Interent: http://interlinc.

Continued from page 2

Treatment Objectives:

1. To inhibit or reduce the conversion of ethylene glycol to its toxic breakdown products. This conversion will generally take place within about 12 hours, but time is very dependent on such factors as the amount of ethylene glycol ingested, and how soon appropriate treatment was begun following ingestion. Thus, conversion of the ethylene glycol to toxic metabolites can persist for periods of time beyond 12 hours.

2. To prevent irreversible renal failure, which would eventually lead to death.

Diagnosis:

The best way to diagnose ethylene glycol poisoning is by direct, chemical analysis of blood or urine for ethylene glycol and/or its metabolite (s). Direct analysis may be unavailable in many locales, and can be fairly expensive. There are several less precise, indirect ways to assist in determining if a dog has been poisoned, including an ethylene glycol test kit, serum anion-gap/osmolality measurements, and various blood and urine urinalyses. The limitations of these various indirect methods must be taken into consideration by the veterinarian when attempting to make a diagnosis.

Irreversible kidney failure is the event that prestages death in the dog from ethylene glycol poisoning consists of a complex involvement of ethylene glycol and its metabolites, rapid progression and overlap of the various clinical signs of the poisoning, and a cascading of metabolic events which place the patient in a critical, life-threatening situation very soon after ingestion of a lethal amount of ethylene glycol. This, coupled with the difficulties often encountered in diagnosing the condition in a rapid and efficient manner, make ethylene glycol intoxication one of the most serious and respected of all poisons in veterinary medicine today.

Antizol-Vet™ (fomepizole) for injection:

Antizol-Vet has been proven to be a safe and effective treatment for ethylene glycol poisoning in dogs if given before enough ethylene glycol has been metabolized to result in kidney failure. Even if treatment is initiated as late as 36 hours post-ingestion and urine output is maintained, prevention of metabolism of any remaining unmetabolized ethylene glycol may be beneficial.

Using Antizol-Vet eliminates the concerns associated with ethanol treatment, including central nervous and respiratory depression, peripheral vasodilation and hypothermia, and hypoglycemia. In the clinical field study, one of 1.5 dogs experienced an anaphylactic type reaction following the second dose of Antizol-Vet. Research would suggest that the low toxicity of Antizol-Vet, as compared to ethanol, should allow the clinician a greater degree of freedom in deciding to initiate treatment in a dog without a definitive diagnosis of ethylene glycol intoxication.

Antizol-Vet is administered only once every 12 hours for four treatments (for a total of 36 hours), as compared to the more frequent or continuous IV administration required by treatment with ethanol. "The intensity of patient management and duration of hospitalization were considerably less when 4-MP [Antizol-Vet] was administered, compared with that associated with ethanol administration." The cost of treatment with Antizol-Vet is minimal compared to the cost of treating kidney failure, i.e. peritoneal dialysis. Antizol-Vet improves prognosis by preventing the damage to the kidney caused by the toxic breakdown products of ethylene glycol. Combining Antizol-Vet therapy with close monitoring and support of the renal and acid base systems is the key to successful management of ethylene glycol intoxication.

*** In order to Protect our Canine's during a deployment, this medication will be added to the Medical Supplies Procurement list. This will make it available when operating in the disaster environment.

Canine Jokes

House Rules

1. The dog is not allowed in the house.
2. Okay, the dog is allowed in the house, but only in certain rooms.
3. The dog is allowed in all rooms, but has to stay off the furniture.
4. The dog can get on the old furniture only.
5. Fine, the dog is allowed on all the furniture, but is not allowed to sleep with the humans on the bed.
6. Okay, the dog is allowed on the bed, but only by invitation.
7. The dog can sleep on the bed whenever her wants, but not under the covers.
8. The dog can sleep under the covers by invitation only.
9. The dog can sleep under the covers every night.
10. Humans must ask permission to sleep under the covers with the dog.

Author Unknown

Creation

On the first day, God created the Dog.
On the second day, God created man to serve the dog.
On the third day, God created all the animals of the earth to serve as potential food for the dog.
On the fourth day, God created honest toil so that man could labor for the good of the dog.
On the fifth day, God created the tennis ball so that the dog might or might not retrieve it.
On the sixth day, God created veterinary science to keep the dog healthy and the man broke.
On the seventh day, God tried to rest, but He had to walk the dog.

Author Unknown

Training

There will be a meeting on February 19th at 7:30 p.m. at Fire Station #14 to talk about training and set dates.

There will be a training on Saturday February 20th weather permitting.

Canine Search Team Type I Evaluation

Indiana Task Force 1 will host a Type 1 (Advanced) Canine Search Team Evaluation in Indianapolis, Indiana on April 23 - 25th, 1999. All National US&R Response System Task Forces are invited to participate, but only 12 canine/handler teams will be accepted into this process. The cost to participate in this evaluation will be $100.00 per dog/handler team. The evaluation is open to Type II Basic certified canines or Type I recertifications only.

Canine Search Specialist Training

On March 14 - 19th, 1999 there will be a Canine Search Specialist Training (CSST) course in Tacoma, Washington. Those attending will be residing at Camp Murray, which is a Washington Army National Guard facility.